VI RIPARIAN RESERVE EVALUATION

This Section of the watershed analysis is intended to address the need to conduct certain management activities within Riparian Reserves. The *Riparian Reserve Evaluation Techniques and Synthesis; Supplement to Section II of Ecosystem Analysis at the Watershed Scale: Federal Guide for Watershed Analysis* (RRE-Supplement) sets forth data needs to be addressed at the watershed analysis level. Depending upon the extent of management activities, the *RRE-Supplement* recommends different depths of analysis. This Section is intended to fulfill the recommendations for a Level 1 Riparian Reserve Evaluation, which is geared toward small management actions within Riparian Reserves or a small percentage change in reserve acres associated with intermittent streams. This level of analysis limits the magnitude of activities within Riparian Reserves to the following:

1.) The amount of Riparian Reserve acreage proposed for 'management'[3] within the analysis area does not exceed 84 acres (10 % of the area delineated by intermittent Riparian Reserves).

2.) The Riparian Reserve width for any given non-fish bearing intermittent stream is not to be reduced below 90 feet (one-half of a site-potential tree).

A Level 1 analysis involves identifying the vulnerability of Riparian Reserve-associated species of concern for the analysis area (Tables VI-1 and VI-2). These tables, as well as the accompanying risk assessment (Tables VI-3 and VI-4), can be used in future site-scale level analysis (NEPA) or a Level 2 Riparian Reserve Evaluation.

How may acres of Interim Riparian Reserves are in the analysis area? How many acres of riparian Reserve are associated with intermittent streams?

For the North Fork Chetco analysis area, the GIS database indicates that interim Riparian Reserves occupy approximately 2,944 acres (32%) of the BLM-managed land (Table I-1), based on a site-potential tree height of 180' (site-potential tree calculation in Appendix E-1). It should be noted that this acreage is an estimate; sources of error include unmapped streams and the difference between the actual location of the interim Riparian Reserve boundary (based on slope distance) and the computer-generated boundary (based on horizontal distance).

The extent of water-dependant vegetation may be used to delineate Riparian Reserves. However, it is highly unlikely that riparian vegetation would extend beyond one-quarter site-potential tree height in the analysis area. The inner gorge may also be used to delineate Riparian Reserve boundaries. The inner gorge is defined as the first slope break above the active channel margin and terraces. In the analysis area the inner gorge often extends beyond one site-potential tree.

[3] For the purpose of acreage calculations, 'management activities' are best defined as; a change in Riparian Reserve widths, timber harvest or salvage, road construction, and those activities potentially inconsistent with the Standards & Guidelines (I.M. OR-95-123)

An initial stratification process to identify intermittent channels (Figure VI-1) indicates that approximately 19 miles of intermittent streams are located on BLM lands. This equates to 840 acres of Riparian Reserve (9% of BLM-managed land in the analysis area) adjacent to intermittent streams.

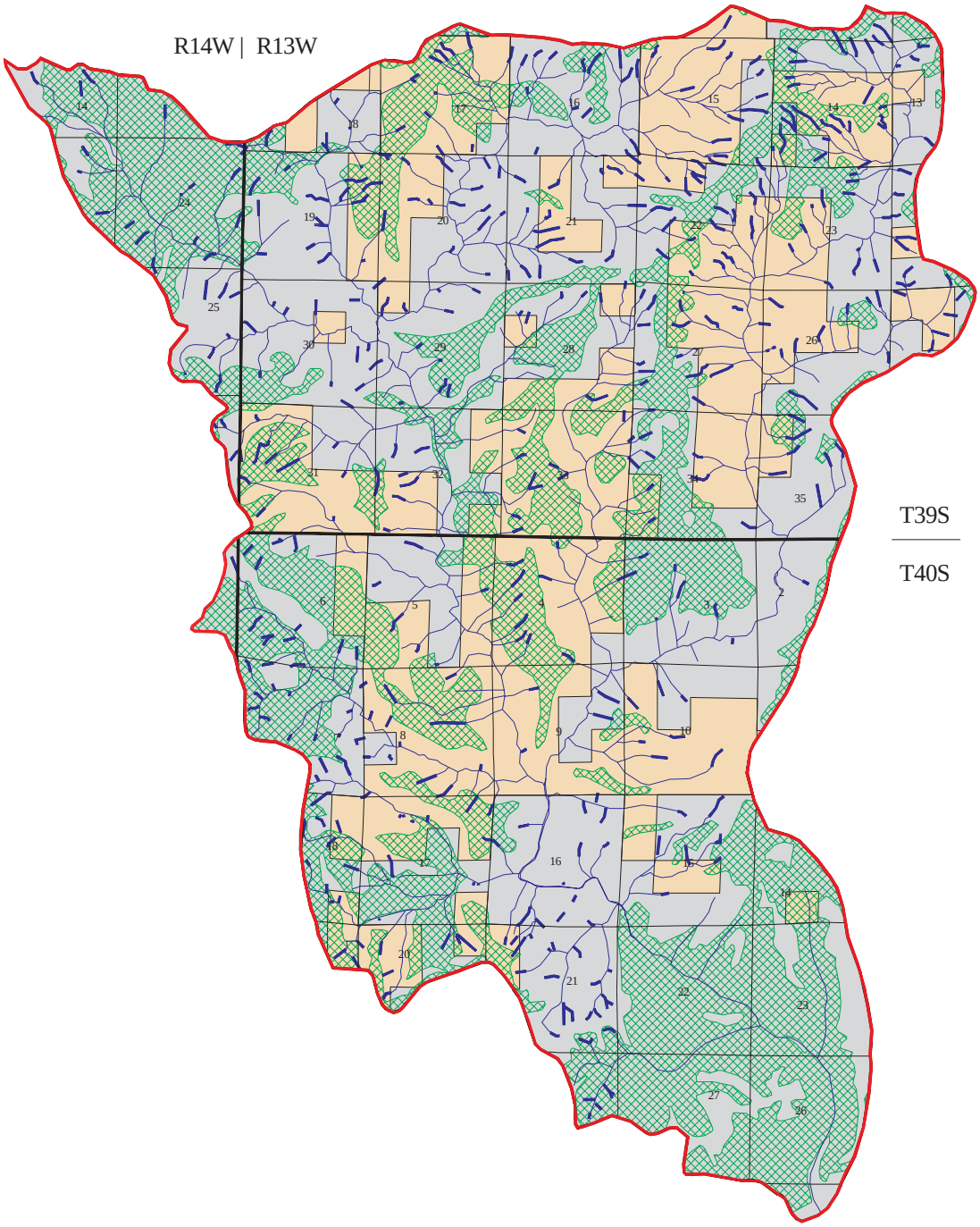
What factors are used to determine intermittent vs. perennial streams?

The spatial position, zone of intermittent/perennial flow and length of intermittent streams were estimated by modeling summer flow recession in small headwater channels throughout the analysis area. Attributes from the Curry County Soil Survey GIS coverage relate table were queried and used to create a mapped estimate of low permeability and deep soils areas. Figure VI-1 shows that a large portion of this area forms ridgetops and broad, upper sideslopes. These soils have lower hydraulic conductivities (<2 inches/hr.), and high porosities (55-60%). More water is stored in the winter as near surface groundwater and released more slowly over the summer months. Nearly all lands located outside the low permeability soil designation have moderate permeabilities and shallower depths.

Differences about permeabilities, soil depths and other soil characteristics were used in a groundwater flow equation to determine how fast water moves through the soil. National Weather Service data for Brookings, OR shows there is an average dry period of about 188 days between May and the end of October. During this period near surface water in soil horizons will travel a distance downslope determined by soil characteristics, geology and Darcy's Law of groundwater flow. The point at which small headwater channel drainage areas "dry down" could reasonably be assumed to support saturated soil conditions and perennial flow. The contributing drainage areas was assumed to be a 120 degree pie shaped arc. Water in lower permeability soils for very small drainage areas, was assumed to recede under channels as summer progressed. However, this water is thought to be forced up and appear as surface flow at the contact with shallow depth, higher permeability soils, or intersect the water surface where the drainage area became too large. By model estimates small drainages on low permeability soils would need a drainage area of 2-10 acres and moderate permeability soils, would need a 10 acre drainage area to support perennial flow in late summer. Based on this analysis, 47 miles of streams are estimated to be intermittent (19 miles on BLM managed lands), representing 38% of 1-2nd order small channel stream density (Table III-1). No confidence bounds have been established for this procedure and needs some verification during the low flow period. Because of modeled parameters and similar groundwater flow recession modeling in other watersheds with late summer field verification the estimate is thought to be slightly conservative or underestimating intermittent channel density.

Intermittent streams in the analysis area tend to be 1st order, high gradient (>10%), low sinuosity, entrenched channels, with low width/depth ratios and bedrock, boulder, cobble, gravel, and/or sand substrates. This description fits A1a, A2a, A3a, A4a, and A5a stream types (Rosgen 1994). Other 1st order streams in the analysis area are more likely to be perennial because the deep, fine-textured soils surrounding these channels store large volumes of water, have low permeabilities, and drain slowly. This would correspond to A6a stream types.

Figure VI−1 Estimated Intermittent Streams & Low Permeability Soils (< 2 inch/hr)



Estimated Intermittent Streams
Hydrology
Low Permeable Soils
Private Lands
BLM Administered Lands

N
W
E
S

Scale = 1:84,480
(.75" = 1 mile)

~ lowperm811.rtl ~

0.5 0 0.5 1 1.5 miles

1 0 1 2 km

A perennial stream is "a stream that typically has running water on a year round basis" (FEMAT 1993). Alternate definitions include "a perennial stream or stream reach has measurable surface discharge more than 80 percent of the time. Discharge is at times partly to totally the result of spring flow or ground-water seepage because the streambed is lower than surrounding ground-water levels" (Meinzer 1923). Well-formed, adjustable channels have continuous channel boundaries and several distinct in-channel features. Fluvial action of sufficient duration (i.e., stream flowing year-round in most years) will carve a low flow channel. This is the so-called inner-berm, and is really a slight depression in the channel bottom which carries the minimum streamflow. Streams that have ponding, such as beaver dams, very coarse substrate, or that flow over bedrock will lack this feature. This cross-section dip is observable in most alluvial channels, but may be somewhat absent in steep juvenile channels. In the analysis area, 127 miles of stream is estimated to be perennial (73% of all channels). However, late summer flow in many of these channels may have “dry” spots and very low water volumes (barely noticeable).

The Myrtlewood hydrologist provided the following interpretations of the terms used in the Northwest Forest Plan definition of intermittent streams:

- To be a nonpermanent drainage feature, the stream should have a streamflow duration of less than 80% of the time.

- A definable channel should have some minimum depth of incision. The channel should be able to convey streamflow, and be essentially continuous. A definable channel can exist even though large organic debris may at times be lying in the channel or partially obscuring the channel.

- Annual scour or deposition usually is evidenced with distinct physical features. This may include: a stream scour line on the edges of the active channel, sediment accumulations behind obstructions in the channel, substrate in the channel more rounded than angular, and evidence of bankcutting on the outside of bends.

Biological criteria are useful in distinguishing between perennial and intermittent streams, and in determining the upstream terminus of perennial surface flow. The presence of aquatic invertebrates with protracted larval histories (> 1 year) (*Lara avara, Juga spp., Philocasca rivularis*), or larval amphibians (tailed frogs, Southern torrent salamanders, Pacific giant salamanders), strongly indicate perennial flow or persistent moisture sufficient to support biota associated with the perennial condition.

Final determination of intermittent streams will be made in the field, based on the following definition and supporting criteria:

> Intermittent streams are defined as any nonpermanent drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria (FEIS ROD, p. B-14). Biological criteria will also be used to help define the boundary between intermittent an perennial flow.

What are the species of concern present in riparian systems in the North Fork Chetco analysis area? What is their relative abundance and distribution?

The *RRE-Supplement* lists procedures to identify species of concern dependant upon the Riparian Reserve network. The list of species of concern was compiled from the following information located in Appendix E:

List 1 - species analyzed in FEMAT and the FSEIS that were expected to benefit from increased Riparian Reserve protection;
List 2 - species analyzed in FEMAT that were expected to benefit from Riparian Reserve protection;
List 3 - species of local concern.

Table VI-1 lists the species of concern for Riparian Reserves grouped by their ecological classification and geographical distribution. Species in the shaded portion of the table are considered of greatest management concern and may require further assessment at the site-scale analysis. Those species in the shaded portion, as well as other 'flagged' species, have been carried forward for further analysis in Table VI-2.

Table VI-1 Ecological classification of riparian species of concern for preliminary vulnerability assessment.

	Localized & Rare	Widely Distributed & Rare or Localized & Common	Widely Distributed & Common
Exclusive & Restricted	**BRYOPHYTES** Kurzia makinoana **AMPHIBIANS** Southern torrent salamander **MAMMALS** White-footed vole **INVERTEBRATES** Redwood juga	**BRYOPHYTES** Scouleria marginata Plagiochila satoi Racomitrium aquaticum **VASCULAR PLANTS** Erythronium revolutum **AMPHIBIANS** Tailed frog **FISH** Coho salmon **INVERTEBRATES** Beers's false water penny beetle Burnelli's false water penny beetle	**BRYOPHYTES** Douinia ovata **AMPHIBIANS** Foothill yellow-legged frog Red-legged frog Northwestern salamander Rough-skinned newt Dunn's salamander **MAMMALS** Little brown myotis **FISH** Fall chinook salmon Winter steelhead Coastal cutthroat trout Pacific lamprey

(continued)

	Localized & Rare	Widely Distributed & Rare or Localized & Common	Widely Distributed & Common
Exclusive & Broad		**MAMMALS** Beaver **INVERTEBRATES** Montane bog dragonfly Denning's Agapaetus caddisfly	**BRYOPHYTES** Antitrichia curtipendula **BIRDS** Common merganser Lesser scaup
Supplemental & Restricted	**VASCULAR PLANTS** Iliamna latibracteata **AMPHIBIANS** California slender salamander Del Norte salamander	**FUNGI** Sarcosoma mexicana *Rare Gilled Mushrooms* Clitocybe subnitopoda **LICHENS** *Riparian Lichens* Collema nigrescens Platismatia lacunosa Ramalina thrausta Usnea longissima *Decaying Wood* Cladonia umbricola Icmadophila ericetorum **VASCULAR PLANTS** Adiantum jordanii **MAMMALS** Red tree vole Western red-backed vole	
Supplemental & Broad		**VASCULAR PLANTS** Allotropa virgata **BIRDS** Pileated woodpecker Northern spotted owl Marbled murrelet **MAMMALS** Fringed myotis Hoary bat Marten Fisher	**FUNGI** *Moss Dwelling Mushrooms* Galerina atkinsoniana Galerina cerina Galerina hetrocysis Galerina vittaeformis Rickenella setipes *Mycorrhizal* Gomphus clavatus Gomphus kauffmanii **LICHENS** *Forage* Alectoria sarmentosa Bryoria capillaris Bryoria glabra *Rock* Pilophorus acicularis **MAMMALS** Big brown bat California myotis Long-eared myotis Long-legged myotis Silver-haired bat

What is the species-habitat relationship for the vulnerable species of concern?

The *RRE-Supplement* recommends classifying Riparian Reserve habitat into seven ecological functional groups. Table VI-2 summarizes habitat associations for vulnerable species of concern which required further analysis (i.e., vulnerable species were those within shaded blocks carried forward the previous Table VI-1 and other previously "flagged" species).

Table VI-2 Habitat associations for *vulnerable* species of concern known or suspected to occur in North Fork Chetco analysis area.

		Habitat Associations							
Species	ACS or S&M	Late-Successional	Riparian	Aquatic - Lotic	Aquatic - Lentic	Seeps, Springs	Rock, Talus	Down Logs	Snags
PLANTS									
BRYOPHYTES									
Douinia ovata	S&M	X	X						
Kurzia makinoana	S&M		X						
Racomitrium aquaticum	S&M		X						
Scouleria marginata	S&M			X					
Plagiochila satoi	S&M	X	X						
FUNGI - Rare gilled Mushrooms									
Clitocybe subnitopoda	S&M	X							
FUNGI -Moss Dwelling Mushrooms									
Galerina atkinsoniana	S&M	X	X						
Galerina cerina	S&M	X							
Galerina hetrocysis	S&M	X	X						
Galerina vittaeformis	S&M		X						
Rickenella setipes	S&M		X						
FUNGI - Mycorrhizal									
Gomphus clavatus	S&M		X						
Gomphus kauffmanii	S&M	X							
LICHENS - Riparian									
Collema nigrescens	S&M	X							

		Habitat Associations							
Species	ACS or S&M	Late-Successional	Riparian	Aquatic - Lotic	Aquatic - Lentic	Seeps, Springs	Rock, Talus	Down Logs	Snags
Ramalina thrausta	S&M	X	X						
Usnea longissima	S&M	X	X						
LICHENS - Decaying Wood									
Cladonia umbricola		X							
Icmadophila erictorum		X							
LICHENS - Forage									
Bryoria capillaris		X							
VASCULAR PLANTS									
Adiantum jordanii		X	X						
Allotropa virgata		X							
Erythronium revolutum		X	X						
Iliamna latibracteata		X	X						
INVERTEBRATES									
Beer's false water penny beetle	ACS		X	X					
Burnelli's false water penny beetle	ACS		X	X					
Montane bog dragonfly	ACS		X		X	X			
Denning's Agapaetus caddisfly	ACS		X	X		X			
Redwood juga (*juga orickensis*)	ACS		X	X		X			
AMPHIBIANS									
Southern torrent salamander	ACS	X	X	X		X			
Tailed frog	ACS	X	X	X		X			
Del Norte salamander	S&M	X					X		
California slender salamander		X						X	
FISH									
Chinook salmon (fall)	ACS			X					
Coho Salmon	ACS			X					

		Habitat Associations							
Species	ACS or S&M	Late-Successional	Riparian	Aquatic - Lotic	Aquatic - Lentic	Seeps, Springs	Rock, Talus	Down Logs	Snags
Winter steelhead	ACS			X					
Pacific lamprey	ACS			X					
Coastal cutthroat trout	ACS			X					
MAMMALS									
Bats, general		X	X	X	X	X	X	X	X
White-footed vole			X						
Red tree vole	S&M	X							

What are the primary biological and physical values associated with Interim Riparian Reserves in the North Fork Chetco analysis area?

Refer to Section IV.2-Aquatic Habitat for detailed discussion of ecological values of riparian zones in North Fork Chetco and the effects of various management activities on these values.

Riparian Reserves are designed to protect physical and biological values (described in the ACS objectives) which are associated with riparian areas as well as to benefit upland species. These physical and biological values include:

- *Structural Complexity*-Riparian zones are characterized by assorted physical processes such as earth movement, deposition, erosion and different fire regimes which create an array of vegetative layers, including standing and down wood, snags, etc. Streamside vegetation often offers a structural contrast to upland habitats within the Riparian Reserves.

- *Diverse Array of Soil Moisture Conditions*-Riparian zones typically contain a diverse mosaic of surface soil conditions which vary in time and space.

- *High Plant and Animal Diversity*-Diversity and complexity of habitat features combined result in high native plant and animal species diversity. Additionally "soft" edges characterizing interface between upland and riparian forest and "hard" edges defining interface between riparian vegetation and stream channel promote riparian species diversity as does the proximity of water and riparian and upland habitats.

- *Sediment Regime*: Riparian trees promote slope stability, most notably along the inner gorge and in other unstable areas. In addition, riparian vegetation moderates the rate of sediment input into stream channels by filtering fine sediments from upslope.

- *Water Quality*- Riparian zones maintain and restore water quality through interception of sediments

and nutrients, and through the moderation of solar radiation.

- *Water Quantity and Delivery*- Riparian zones in the analysis area have little value for water storage and delivery. Steep hillslopes and the lack of floodplains offer few sites for water storage.

- *Connectivity and Interspersion of Habitat Features*- Riparian ecosystems have a linear form, providing connectivity across the landscape. In addition to providing protective pathways for riparian-associated animals, riparian zones facilitate dispersal between widely dispersed upslope habitat areas by serving as "stepping stones" for animals dispersing between LSRs or across the landscape. Riparian Reserves support two functions for connectivity:

    1. Landscape scale - Facilitating the movements of mobile species associated with late-successional habitat as they move between large LSRs. Riparian Reserves can serve as "stepping stones" of late-successional habitat between LSRs.

    2. Subwatershed/Site scale - Supporting persistent populations of relatively immobile species associated with late-successional and riparian habitat in order to facilitate genetic interchange between adjacent populations and to prevent isolation of populations.

- *Nutrients*- Riparian zones provide the foundation for aquatic foodwebs through the contribution of organic material. In turn, invertebrates produced in the aquatic system provide a major food source for many terrestrial animals. Additionally, the return and decay of anadromous fish carcasses provide nutrients that are subsequently stored in riparian areas.

- *Refugia*-Riparian zones provide refugia for organisms during stress and disturbance. For example, terrestrial animals utilize riparian zones for thermal regulation during winter and summer months. In the administrative sense (i.e., implementation of the NW Forest Plan), Riparian Reserves play a critical role in providing refugia for sessile and less-mobile late-successional species by maintaining a higher quality habitat conditions in relation to adjacent GFMA lands (i.e., high levels of down logs and snags) as well as serving as species source-areas for repopulating adjacent areas undergoing harvest and subsequent recovery.

How sensitive are the resource values associated with Riparian Reserves to potential hazards?

Table VI-3 summarizes the sensitivity of the identified resource value to potential hazards which may occur within the analysis area. The table evaluates the likelihood that a given resource value will experience a decrease in function in the short term (zero-to-ten years) and long term (beyond ten years) if a listed hazard occurs. It is important to note that the type and severity of hazard will effect the vulnerability and that those listed below are intended to reflect the "worst case scenario". For a detailed discussion on the effects of various management activities on riparian zones refer to Section IV.4-Riparian Habitat.

Table VI-3 Hazards to values associated with Riparian Reserves

Resource Value	Zone of Effect[1]	Associated species groups by habitat-type	Hazard	Vulnerability of Resource Value to Decrease in Function (short/long term[2])
Structural Complexity	1-5	Late-successional Riparian Lotic Lentic	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	Moderate/Moderate Low/Low Low/Low Low/Low Moderate/Moderate
Soil Moisture	2 - 5	Late-successional Riparian Seeps/Springs	Harvest Windthrow Landslides Peak/Base Flow Changes Fire	Moderate/Low Low/Low Low/Low Low/Low High/Moderate
Microclimate	2-5	All	Harvest Windthrow Landslides Peak/Base Flow Changes Fire	High/Moderate Moderate/Low Moderate/Moderate Moderate/Moderate High/Moderate
Plant & Animal Diversity	1-5	All	Harvest Windthrow Landslides Peak/Base Flow Changes Fire	Moderate/Moderate Low/Low Low/Low Moderate/Low High/Moderate
LWD Recruitment-Aquatic	1 - 4	Late-successional Riparian Lotic Lentic Seeps/Springs	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/High Low/Low Low/Low Low/Low Low/Low
Down Logs	2-4	Late-successional Riparian	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/High Low/Low Low/Low Low/Low Low/Low
Sediment Regime	1 - 4	Lotic Lentic Riparian Seeps/Springs	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/Moderate Low/Low High/High High/High High/High

Streambank/Slope Stability	1 & 2	All	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/Moderate Moderate/Low High/Low High/Moderate High/Low
Water Temperature	1 - 3	Riparian Lotic Lentic Seeps/Springs	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/Moderate Moderate/Low Low/Low Moderate/Moderate High/Moderate
Water Quantity	1-5	All	Harvest Windthrow Landslide Fire	Moderate/Low Low/Low Low/Low High/Low
Connectivity	1-5	All	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/Moderate Low/Low Low/Low Moderate/Moderate High/Moderate
Nutrients	1-5	All	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/Low Low/Low Low/Low Moderate/Moderate High/Low
Refugia	2-5	All	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/Moderate Low/Low Moderate/Moderate Moderate/Moderate High/Moderate
Snags	3-5	Late-successional Riparian	Harvest Windthrow Landslide Peak/Base Flow Changes Fire	High/High Moderate/Moderate Moderate/Moderate Low/Low Moderate/Moderate

[1]Zones of Effect:

Zone 1 - Aquatic (includes streams and seeps
Zone 2 - Stream bank (includes splash zone)
Zone 3 - Zone of riparian influence (includes area inhabited by riparian vegetation)
Zone 4 - ½ site potential tree height (approximately 90')
Zone 5 - One site potential tree height

[2]Vulnerability/Susceptibiliy is defined as the potential for the relevant resource value to experience a decrease in function as a result of the identified hazards (should they occur).

How will various management activities effect the rate or magnitude of hazards to the Riparian Reserves?

Table VI-3 discussed the relative vulnerability/susceptibility of the physical and biological values of Riparian Reserves to various hazards should they occur. Table VI-4 is an evaluation of how certain management activities may effect the *rate* or *magnitude* of those hazards if the activity is implemented. Site-scale analysis will determine a more accurate assessment of the specific impact.

Table VI-4 Evaluation of the susceptibility of various hazards to increases in rate or magnitude following a given management activity.

Management Activities (carried out under ACS requirements)	Hazard	Susceptibility of hazard to increase in rate/magnitude given management activity	
		Short Term	Long Term
Reduction in Riparian Reserve Width (Hardwood conversions and accompanying activities)	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow	Low Low Low Low Moderate-High Low-Moderate	Low Low Low Low Low-Moderate Low
Density Management/ Commercial Thinning	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow	Low Low Low Low Low-Moderate Low	Low Low Low Low Low-Moderate Low
Road-building and reconstruction	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow Wildfire	Moderate Low-Moderate Moderate-High Moderate-High Low-Moderate Low Low	Moderate Low Moderate Moderate Low-Moderate Low Low
Road-decommissioning	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow Wildfire	Low Low Low-Moderate Low-Moderate Low Low Low-Moderate	Low Low Low Low Low Low Low-Moderate

(continued) Management Activities (carried out under ACS requirements)	Hazard	Susceptibility of hazard to increase in rate/magnitude given management activity	
		Short Term	Long Term
Silvicultural Practices; PCT, release, fertilization, etc.	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow	Low Low Low-Moderate Low Low Low	Low Low Low Low Low Low
Riparian Silviculture	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow	Low-Moderate Low Low-Moderate Low Moderate-High Moderate	Low Low Low Low Low Low
Prescribed Fire	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow	Moderate-High Low Moderate-High Moderate Moderate-High Moderate	Low-Moderate Low Low Low Moderate Low
In-stream Projects	Landslide Peak/Base Flow Changes Water Quantity/Quality Sediment Regime Temperature/Humidity Windthrow	Low Low Low-Moderate Low-Moderate Low Low	Low Low Low Low Low Low

Under this Level of analysis, what activities are appropriate within Riparian Reserves?

Activities which meet or do not prevent the attainment of ACS objectives may occur within Riparian Reserves. Activities such as; road decommissioning, riparian silviculture, in-stream projects, may retard attainment of ACS objectives in the short term (i.e., by increasing sedimentation or by removing riparian vegetation), however, these actions help attain ACS objectives in the long-term and are appropriate for Riparian Reserves. However, management activities listed in the previous Table VI-4 that are accompanied by moderate-to-high increases in rate or magnitude of hazards in both the short AND long term should have the appropriate hazard identified as a key issue during site-scale (NEPA) analysis.

This Level 1 evaluation sets limitations on the amount of management activities which can occur within the analysis area. Management activities which effect more than 84 acres or reduction in Riparian Reserves to less than 90 feet width will require a Level 2 Riparian Reserve Evaluation.

Are there areas where modification to the interim Riparian Reserves along intermittent

streams could occur? What are guidelines for modification?

Based on the proceeding analysis and the professional judgement of wildlife, fisheries, botany, hydrology, and soils specialists, there are opportunities to modify the interim Riparian Reserve boundaries on some intermittent streams in accordance with the Aquatic Conservation Strategy. The team recognizes that the analysis area encompasses diverse geomorphic features and habitats, and that the distributions of the species listed in Table VI-1 are not mapped for this area or completely understood. Therefore, any modifications of interim Riparian Reserve boundaries must be analyzed at the site level and tailored to the specific features and biota of the site. The final Riparian Reserve must be of sufficient width to assure protection of riparian and aquatic functions, and to maintain the integrity of the Key Watershed. To this end, the following recommendations are intended to guide the interdisciplinary team in subsequent site-level analysis and planning:

General Recommendations:

1. Riparian Reserves on areas subject to mass wasting or shallow-rapid debris flows, extremely steep soil hazard (Figure III-3), and sensitive soils including FGR1 and FGR2 (Figure III-4) should be wide enough to protect the aquatic system from landslides and sediment delivery.

2. Seeps/springs/wetlands - ensure these special habitats are included within Riparian Reserves and that the reserve widths are sufficient to maintain the characteristics of the site (e.g. shading, cool water, sediments, stable substrates, similar flow patterns/timing, maintenance of riparian vegetation, etc.).

3. Rocky habitats - when rocky habitats occur within Riparian Reserves, ensure that Reserve widths are sufficient to maintain the characteristics of the site (e.g. temperature, humidity and wind velocity).

4. Consider the habitat connectivity value of Riparian Reserves for fish and wildlife. Connectivity values include connecting adjacent drainages across ridges, providing stepping stones of late-successional habitat across the landscape, and maintaining linkages along stream reaches for terrestrial and aquatic species.

5. The following species are terrestrial and occur within the outer one-half of the interim Reserve width. Impacts to these species will be greater through loss of habitat and changes in microclimate. Therefore, presence of the these species should be determined prior to management actions that reduce Riparian Reserve widths.

BRYOPHYTES
- Kurzia makinoana
- Plagiochila satoi
- Racomitrium aquaticum